

# UNCOVERING THE HIDDEN STRUCTURE OF PLATOONS: FORMAL AND EMERGENT LEADERS' PERCEPTIONS OF ORGANIZATIONAL NETWORKS

Daniel B. Horn\*  
Booz Allen Hamilton  
McLean, VA 22102

Elizabeth A. Conjar  
George Mason University  
Fairfax, VA 22031

## ABSTRACT

We report on a study of the accuracy of Soldiers' perceptions of advice and friendship networks within US Army Infantry rifle platoons. The ability to accurately perceive the informal advice networks within a platoon is shown to be correlated with both formal leadership positions and emergent leader ratings. That is, individuals in leadership roles and those who, regardless of their formal role, are seen by their peers as possessing leadership qualities were more accurate than non-leaders in their understanding of the informal structure of the platoons. We discuss the implications of these findings with regard to prevailing theories of leadership.

## 1. INTRODUCTION

US Army Infantry platoons are hierarchically structured organizations embedded at the base of a vast hierarchically structured Army. They regularly engage in highly risky, life or death missions that rely on the ability of the platoon members to communicate, anticipate, and synchronize their actions while fluidly adapting to the situation around them. The effectiveness of such organizations is tied to the extent to which team members share an understanding of the group's dynamics, and can be thought of as a component of shared situational understanding and a necessary enabler of trust. Leaders who do not understand the dynamics of their organization are at a disadvantage which may impact their ability to effectively lead. Likewise, non-leaders who are capable of developing an accurate picture of an organization's informal structure are well poised to emerge as informal leaders.

In light of this argument, the current study examines advice and friendship networks within Infantry rifle platoons. We are interested not only in the structures of these informal networks, but also in the ways that different Soldiers perceive them. More specifically, we wish to understand whether the roles and perceptions of formal and emergent leaders differ from those of non-leaders, and if so, how. We approach this topic through the lens of social network analysis.

## 1.1 Social Networks

The term "social network" refers to a set of actors who are connected by a set of ties. Actors, often referred to as nodes in network theory, can be persons, teams, organizations, etc. (Borgatti & Foster, 2003). One of the central concepts in the study of interpersonal relationships is the structure of the dyadic ties found within the network. Ties are the medium through which interpersonal resources such as advice, work, or friendship flow, while structure is the pattern of connections found among network members (Balkundi & Harrison, 2006). As such, the structure of any social system can be defined as a set of relations between all pairs of individuals who are members of the network (Krackhardt, 1987a).

Using SNA, researchers can characterize individuals, subgroups, and entire organizations statistically. Among the most common individual-level measures are those of centrality. The simplest centrality measure, *degree*, is equal to the number of connections an individual has. When the connections between individuals are directional (i.e., a connection may or may not be reciprocated), we can differentiate between an individual's *in-degree* (the number of connections received from others) and *out-degree* (the number of connections sent to others).

Traditional SNA research focuses on a single representation of the network being studied. This view of the organization can be based on data collected through various approaches. For example, the network may reflect the responses to survey items about who one works or is friends with, or may represent the flow of e-mails within an organization. Regardless of how the data are collected, we have a single view of the network.

An alternative, the Cognitive Social Structures (CSS) approach not only includes collecting each individual's perceptions of *their own* relational ties within the network, but also each individual's perceptions of the relations (or lack thereof) between *all the members* of a network (Krackhardt, 1987a). By collecting CSS data, researchers gain multiple representations (one for each organization

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member) of the same network, and one is able to gauge an individual's *cognitive accuracy*, defined as the extent to which one's perception about the existence of ties within the network approximates the "actual" structure of that network (Bondonio, 2001). In our study, the "actual" network is created using Krackhardt's (1987a) Locally Aggregated Structure technique in which a link between two people is said to exist only if both individuals agree that the link exists. As described in the methods and results sections below, we collected data on the structure of both the advice and friendship networks within platoons.

Thus, accuracy in the advice network indicates understanding of who each individual views as knowledgeable in the organization, how work gets done in the network, and how daily routine exceptions are handled (Krackhardt & Kilduff, 2002). Accuracy in perceiving the network of friendships on the other hand indicates an understanding of who trusts whom in the organization, who is likely to get along during task accomplishment, and where coalitions may lie.

From a leadership perspective, the precision of leaders' perceptions is an important construct to assess as accuracy plays an important role in explaining various social phenomena (Bondonio, 1998). For example, Krackhardt (1990) found that individuals who were more accurate in gauging the structure of their social network were rated as more powerful by others in the organization. Power gives leaders the ability to influence other network members via identification, compliance, and the capability to get other individuals to commit to and support their ideas (Yukl, 2001). Furthermore, accuracy is an indicator of social intelligence, a critical individual difference variable that has been shown to predict leader effectiveness (Cavins, 2006; Morris, 1997; Zaccaro, Gilbert, Thor, & Mumford, 1991). Greer, Galanter, and Nordlie (1956) for example found that infantry rifle squads with more accurate leaders performed better on a field task than did squads with less accurate leaders.

## 1.2 Formal Leadership

As summarized by Yukl (2001), "most definitions of leadership reflect the assumption that it involves a social influence process whereby intentional influence is exerted by one person over other people to structure the activities and relationships in a group or organization" (p. 3). Researchers have argued that the two fundamental requirements for leaders at all organizational levels are to provide direction for collective action and to manage the operations of the units under their control (Jacobs & Jacques 1991; Zaccaro, 1999). Thus formal leaders, as a function of their leadership role, must engage in behaviors such as coordinating plans, informing, supporting, managing conflict, team building, monitoring operations, observing

the organizational environment, etc. (see Yukl, 2006 for a full review). In turn these behaviors increase the probability that formal leaders will form more accurate representations of the social networks of their supervisors, peers, and subordinates than will non-leaders by requiring them to actively interact with other network members and get a sense of who has ties to whom. For instance, network researchers interested in leadership theory have speculated that to be effective, leaders must be aware of the relations between their subordinates as well as the extent to which these relations involve embedded ties such as advice and friendship (Balkundi & Kilduff, 2005). Geiwitz (1993) argues that understanding and monitoring social dynamics within the work domain is a fundamental leadership skill.

*Hypothesis 1a: Formal leaders have more accurate representations of the advice network than do subordinates.*

*Hypothesis 1b: Formal leaders have more accurate representations of the friendship network than do subordinates.*

## 1.3 Emergent Leadership

According to Hogan, Curphy, and Hogan (1994), "research on leadership emergence identifies the factors associated with someone being perceived as leaderlike" (p. 496). Lord and Maher (1991) have echoed this statement defining "leadership as the process of being perceived by others as a leader" (p. 11). Thus, theorists recognize that leadership can only exist if it is acknowledged and agreed upon by other group members (Bass, 1990). Indeed, emergent leaders are often recognized as such due to interactions in the group that indicate that they have the necessary knowledge, skills, and abilities to help the group obtain its objectives.

Accordingly, emergent leaders should be able to accurately perceive informal social networks due to their increased interaction in the social system and their interest in guiding other people. Past research has shown that individuals recognized as emergent leaders feel a strong desire to manage and guide people, an aspiration referred to as leadership motivation (Kirkpatrick & Locke, 1991). Individuals who typically emerge as leaders think a lot about being the person in charge, influencing other people, and winning arguments. Additionally, leadership and consequently leadership emergence is inherently social in nature (Yukl, 2006; Zaccaro et al., 1991). Leaders are recognized as such by engaging in behaviors such as influencing others as well as managing, shaping, and developing the collective activities of the group (Jacobs & Jaques, 1991; Zaccaro, Rittman, & Marks, 2001). Consequently, emergent leaders should have more accurate representations of the social networks in which they are embedded given that they tend to engage in fundamental

leader behaviors more often than individuals not recognized as leaders.

*Hypothesis 2a: Individuals rated high on emergent leadership have more accurate representations of the advice network.*

*Hypothesis 2b: Individuals rated high on emergent leadership have more accurate representations of the friendship network.*

## 1.4 Soldier Schemas and Biases

We also investigated at the *local* or individual level if infantry platoon members give higher leadership ratings to their own advice and friendship relations. In a study conducted with 187 Naval Aviation Cadets, Hollander and Webb (1954) found that estimates of leadership ability were independent of friendship ties. Past research has also shown that individual-level advice seeking behavior is related to level of education (Klein, Lim, Saltz, and Mayer, 2004), a construct that reflects knowledge and competence as does the ratings of leader ability collected in the current study. Thus, it was hypothesized that individual-level leadership ratings are associated with advice but not friendship choices, indicating that individuals seek advice from those whom they consider good leaders, but that friendship choices are unrelated to assessments of leadership ability.

*Hypothesis 3: Individual-level leadership ratings are associated with advice but not friendship choices.*

At the *global* or group level, we were interested in whether friendship and advice relationships occur between individuals who have similar levels of group-rated leadership ability. The theory of network homophily, or similarity-attraction theory (Byrne, 1971), predicts that individuals will make friends with and seek advice from others who are similar to them in terms of personality, values, and demography. For example, Sprecher and Regan (2002) found that individuals preferred to be friends with others who shared their values, attitudes, and interests. Consequently, we hypothesized that individuals form advice and friendship ties with individuals who are similar to them in leadership ability.

*Hypothesis 4a: Network members form advice ties with other individuals who are similar to them in leadership skill*

*Hypothesis 4b: Network members form friendship ties with other individuals who are similar to them in leadership skill*

## 2. METHOD

### 2.1 Participants and Design

Members of 4 US Army Infantry rifle platoons, two platoons in each of two companies in a single brigade, were recruited to participate in this study. In contrast to other, non-military organizations, rifle platoons have a particularly explicit hierarchical structure, rank structure, and role designation. Within the hierarchical structure of the rifle platoon, there are four distinct levels at which formal leadership of subordinates occurs. The nature of the paygrade structure of the Army means that, three of those four levels of leadership are associated with the amount of time spent in the Army. As enlisted Soldiers, team leaders, squad leaders, and platoon sergeants achieve their positions by virtue of their performance at the lower levels of such platoons. Platoon leaders, in contrast, are junior commissioned officers who have typically been in the Army for no more than a few years<sup>1</sup>. One ideal aspect of observing rifle platoons is that we have the opportunity to examine multiple networks of nearly identical formal structure, training, and mission. Most previous studies of this sort have focused on single group or organization, leading to the possibility that their findings may reflect idiosyncrasies of the organizations or their constituent members.

The response rate for 3 of the platoons was 100% ( $n = 35$ ,  $n = 32$ , and  $n = 30$ , respectively), while the response rate for the fourth platoon was 56% (20 out of 36). Therefore the remainder of this report focuses on the 3 complete platoons, which we shall refer to as Platoons 1, 2, and 3. Women are not permitted to serve in US Army Infantry platoons, thus our sample was 100% male. Demographic data for each platoon is presented in Table 1. These platoons were in the midst of their pre-deployment training in preparation for deployment in support of Operation Iraqi Freedom, and each had a small number of open positions to fill before deployment. Data collection occurred in the Spring of 2007, the units deployed in the Fall of 2007.

### 2.2 Procedure

Data were collected on an Army post. On the day of collection, each platoon arrived as a group, and each individual was given a questionnaire packet to fill out. The questionnaires took 30-40 minutes to complete. For Soldiers who were unavailable (e.g., on duty, on leave, in training), the Platoon Sergeant was given an envelope containing the instructions and questionnaire packet to be completed and

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<sup>1</sup> This, of course, excludes the small number of officers who have transitioned from prior experience as enlisted Soldiers, or who have extended experience in the reserve component or other branches of the armed services.

returned to a local point of contact. The contact person then forwarded the questionnaire packets to the research team.

Table 1. Platoon demographic information. Means (Standard Deviations)

	Platoon 1	Platoon 2	Platoon 3	Overall
N	35	32	30	97
Age	25.2 (4.5)	24.3 (4.1)	24.7 (5.0)	24.8 (4.5)
Yrs in Army	4.4 (3.3)	3.9 (3.0)	4.3 (3.8)	4.2 (3.3)
Yrs in Unit	2.2 (0.8)	2.0 (0.8)	2.1 (0.6)	2.1 (0.7)

### 2.3 Materials

A background questionnaire was used to collect demographic and attitudinal data. Demographic data including age, rank, race, time in Army, time in unit, deployment history, and formal role in the platoon. Attitudinal data included a measure of extraversion.

Network data were collected using a packet of network questionnaires. Each page had the name of a “target” person on the top left corner of the page. For each target person, there was one emergent leadership question adapted from Hains, Hogg, and Duck (1997), “To what extent does (name) have the qualities necessary to be a good leader?” which could be answered using a 5-point Likert scale where one was “not at all” and five was “to a very great extent.”

The remainder of the page included a list of all members of the platoon, except the target person, and two columns of check boxes. The first column was used to assess the advice network, and had the heading, “Does the target person *seek work-related advice from* these people?” The second column was used to assess the friendship network and had the heading, “Is the target person *friends with* these people?” Participants were instructed to check the appropriate box in each column if the answer was yes.

The questionnaire took approximately 30-40 minutes to complete. To control for order effects and questionnaire fatigue, a unique roster order was generated for each participant. This order consisted of the participant’s name listed first, followed by all remaining platoon members in random order. The order of pages was identical to the list of names on each page (with that page’s target person’s name removed). This meant that each participant first indicated his own out-degree advice and friendship networks, followed by those of the other members of his platoon in random order.

### 3. RESULTS

Within each platoon, an “actual” friendship network and an “actual” advice network were created using the Krackhardt (1987a) Locally Aggregated Structure technique described above. Each individual’s accuracy for each type of relation (friend or advice) was calculated as the correlation coefficient between the “actual” network and the individual’s reported network.

Table 2. Means, standard deviations, and correlations (correlations significant at  $p < .05$  are **bold**)

	Mean	SD	Rank	Age	Time in Army	Time in Unit	Extraversion	Formal Leader (yes/no)	Emergent Leader	Advice Acc.	Friend Acc.	Advice In	Advice Out	Friend In	Friend Out
Rank	1.60	1.07	-												
Age	24.77	4.51	.47	-											
Time in Army	4.19	3.32	<b>.64</b>	<b>.66</b>	-										
Time in Unit	2.09	0.74	-.17	.12	.03	-									
Extraversion	3.58	1.02	.17	.08	<b>.24</b>	-.06	-								
Leader (Yes/No)	1.38	0.49	<b>.83</b>	<b>.45</b>	<b>.62</b>	-.15	<b>.29</b>	-							
Emergent Leadership	3.00	0.81	<b>.50</b>	<b>.26</b>	<b>.36</b>	.04	<b>.21</b>	<b>.59</b>	-						
Advice Accuracy	0.26	0.10	<b>.49</b>	.19	<b>.38</b>	-.10	.11	<b>.56</b>	<b>.49</b>	-					
Friend Accuracy	0.28	0.13	-.17	-.10	-.10	<b>.32</b>	-.09	-.15	.02	<b>.27</b>	-				
Advice In-degree	15.10	17.21	<b>.65</b>	<b>.46</b>	<b>.63</b>	-.05	<b>.28</b>	<b>.72</b>	<b>.61</b>	<b>.52</b>	-.07	-			
Advice Out-degree	15.10	9.89	<b>-.28</b>	<b>-.22</b>	<b>-.32</b>	.07	.00	<b>-.27</b>	-.13	-.06	-.01	-.07	-		
Friend In-degree	21.02	15.47	<b>-.53</b>	<b>-.34</b>	<b>-.45</b>	<b>.25</b>	-.03	<b>-.55</b>	-.09	-.16	<b>.37</b>	<b>-.34</b>	<b>.21</b>	-	
Friend Out-degree	21.02	15.14	<b>-.56</b>	<b>-.41</b>	<b>-.46</b>	<b>.27</b>	-.00	<b>-.60</b>	-.11	<b>-.30</b>	<b>.31</b>	<b>-.40</b>	<b>.32</b>	<b>.87</b>	-

In order to test the hypotheses stated above, analyses were conducted controlling for extraversion, tenure in the organization, individual in-degree centrality, and time in unit. Means, standard deviations, and correlations can be found in Table 2.

To test hypotheses 1a and 1b, that formal leaders have more accurate representations of the advice/friendship network than do subordinates, ANCOVAs were conducted entering the control variables as covariates. Results of the ANCOVAs (see Table 3) revealed that formal leaders were significantly more accurate in their perceptions of the advice network than were subordinates lending support for hypothesis 1a. No support was found for hypothesis 1b however, as there was not a significant difference between leaders' and non leaders' accuracy in the friendship network.

Table 3: ANCOVA for Advice and Friendship Accuracy

Source	Advice accuracy			Friendship accuracy		
	<i>df</i>	<i>MS</i>	<i>F</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Extraversion	1	0.00	0.44	1	0.01	0.68
Time in Army	1	0.00	0.01	1	0.00	0.00
Time in Unit	1	0.00	0.05	1	0.06	4.62*
In-Degree	1	0.03	4.42*	1	0.11	7.97*
Formal Leader	1	0.06	7.83*	1	0.01	0.49
Error	87	0.01	--	87	0.02	--

\* $p < .05$ . \*\* $p < .01$ .

To test hypotheses 2a and 2b, that individuals rated high on emergent leadership have more accurate perceptions of the advice/friendship networks, hierarchical regressions were conducted where the control variables were entered first followed by the emergent leadership ratings. As shown in Table 4, emergent leadership was significantly related to accuracy in the advice network lending support for hypothesis 2a. In regards to hypothesis 2b, emergent leadership was not significantly related to accuracy in the friendship network (see Table 4). Thus, no support was found for this hypothesis.

Hypothesis 3, which stated that individual-level leadership ratings are associated with advice but not friendship choices, was tested by calculating the Quadratic Assignment Procedure (QAP) correlation between leadership ratings and advice network ties as well as the QAP correlation between leadership ratings and friendship network ties, in each of the three infantry platoons. QAP correlations (Hubert & Schultz, 1976; Krackhardt, 1987b) are utilized when one is testing hypotheses regarding the relations between matrices in order to eliminate the autocorrelation that results from the non-independence of the rows and columns of a social network sociomatrix. With autocorrelation, results will typically be inflated estimates of statistical significance if ordinary least squares (OLS) regression is used. The QAP technique is designed to provide unbiased estimates of statistical significance in

situations where one would like to measure the correlation between matrices<sup>2</sup>.

Table 4: Hierarchical Regression Analysis for Variables Predicting Network Accuracy (N = 98)

Advice Network Accuracy			
Variable	$\beta$	Model $R^2$	$F$ Change
Step 1		0.29	9.24*
Extraversion	-0.05		
Time in Army	0.09		
Time in Unit	-0.08		
In-Degree	0.48*		
Step 2		0.34	6.94*
Extraversion	-0.06		
Time in Army	0.11		
Time in Unit	-0.10		
In-Degree	0.29*		
Emergent Leader	0.29*		
Friendship Network Accuracy			
	$\beta$	Model $R^2$	$F$ Change
Step 1		0.45	5.75**
Extraversion	-0.09		
Time in Army	0.11		
Time in Unit	0.23*		
In-Degree	0.34*		
Step 2		0.45	0.21
Extraversion	-0.09		
Time in Army	0.05		
Time in Unit	0.22*		
In-Degree	0.34*		
Emergent Leader	0.05		

\* $p < .05$ .

Significant QAP correlations were found between leadership ratings and advice network ties in platoon 1, platoon 2, and platoon 3 (see Table 5). However, only one significant correlation, in platoon 1, was found between leadership ratings and friendship network ties while the other two were non-significant. Overall then hypothesis 3 was supported as leadership ratings were associated with advice seeking behavior in each of the three networks, but were not associated with friendship choices in 2 out of the 3 networks.

<sup>2</sup> The QAP approach provides a straightforward estimate of the significance of the correlation between matrices through the following procedure. First, OLS correlation coefficients are calculated between the matrices representing the dependent and independent variables. Then, the rows and columns of the dependent variable matrix are randomly permuted and a new OLS correlation coefficient is calculated between this permuted matrix and the unpermuted independent variable matrix. This correlation coefficient is recorded, and the second step is repeated a large number of times (in this report, 2000 times). Then, the correlation coefficient in the first step is compared to the distribution created by the permuted correlations. The significance level of the initial correlation coefficient is equal to the proportion of the permuted correlations that are at least as large. Thus, if 5% of the permuted correlations are at least as large as the unpermuted correlation, a  $p$  value of 0.05 is observed.

Table 5: QAP Correlation between Individual-level Leadership Ratings and Advice/Friendship Network Ties

	Platoon 1 <i>r</i>	Platoon 2 <i>r</i>	Platoon 3 <i>r</i>
Advice Network	0.17**	0.31**	0.15**
Friendship Network	0.10**	0.03	0.04

\* $p < .05$ . \*\* $p < .01$

To test hypothesis 4a and 4b, that individuals form advice and friendship ties with others who are similar to them in terms of group-rated leadership ability, congruence scores of leadership skill were first calculated and then QAP correlations were run for both advice and friendship relations in all three platoons. Congruence scores were calculated for each network by making a “leadership skill” congruence matrix, where the absolute difference between every pair of individuals’ leadership ability scores were calculated and then entered into the appropriate cell in the matrix. A higher cell number between two individuals represented a greater difference in leadership skill between the two network members, and thus negative correlations were expected if hypotheses 4a and 4b were to be supported. As shown in Table 6, results revealed that hypothesis 4a was not supported, as there were no significant QAP correlations found between the leadership skill congruence matrix and LAS advice network in any of the platoons. Hypothesis 4b on the other hand was supported, as QAP correlations were significant across all three platoons. These results indicate that friendship but not advice network ties tend to occur between individuals of similar leadership ability.

Table 6: QAP Correlation between group-level leadership skill congruence scores and advice/friendship network ties

	Platoon 1 <i>r</i>	Platoon 2 <i>r</i>	Platoon 3 <i>r</i>
Advice Network	-0.07	0.08	0.13
Friendship Network	-0.17**	-0.23**	-0.18**

\* $p < .05$ . \*\* $p < .01$

Finally, to compare the networks of formal leaders to the networks of subordinates, t-tests were computed comparing the mean in-degree and out-degree centrality scores of the two groups. Results revealed that formal leaders had a significantly higher in-degree and a significantly lower out-degree than did subordinates in the advice network (see Table 7). This finding indicates that formal leaders tend to have more network members seeking advice from them, while subordinates tend to seek advice from more network members. Additionally, subordinates tended to seek advice from individuals of a higher organizational status as indicated by leaders higher in-degree centrality. Turning to the friendship networks, results of the t-tests revealed that subordinates’ in-degree scores as well as their out-degree scores were significantly higher

than formal leaders’ in-degree and out-degree scores (see Table 7). Thus, in the “actual” friendship networks subordinates confirmed that more individuals were friends with them as well as had more of their friendship nominations confirmed.

Table 7: Means and t-tests of Indegree and Outdegree by Organizational Position

Position	Subordinate ( <i>N</i> = 58)		Leader ( <i>N</i> = 35)		<i>df</i>	<i>t</i> -value
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Advice Indegree <sup>a</sup>	5.8	6.1	31.7	18.1	39	-8.16**
Advice Outdegree <sup>a</sup>	17.3	11.0	11.7	6.9	91	3.00**
Friend Indegree	27.4	13.1	10.3	12.3	91	6.23**
Friend Outdegree	28.0	12.7	9.5	10.9	91	7.20**

\* $p < .05$ . \*\* $p < .01$ .; *Note:* <sup>a</sup> Due to unequal group size, Levene’s Test for Equality of Variances was significant and thus the numbers reported are based on the t-values computed when equal variances are not assumed.

#### 4. DISCUSSION

The current study examined the advice and friendship networks of Infantry rifle platoons in order to determine the ways that different Soldiers perceive them. Results from the study revealed a number of interesting findings.

First, it was shown that formal leaders, by virtue of their formal position, have a more accurate understanding of the informal work structure. This is in line with the argument put forth by Jacobs and Jaques (1991) that suggests that leaders, as a function of their leadership role, must engage in specific behaviors which increases leaders’ interactions in the group. In turn, increased interaction aids leaders in developing accurate perceptions of the relations between their fellow network members. Given that accuracy is an indicator of power (Krackhardt, 1990), social intelligence (Zaccaro et al., 1991), and has been shown to be related high group performance (Greer, 1956) it is beneficial to uncover the positive relationship between formal leadership and advice network accuracy in the studied Infantry platoons.

Second, it was shown that individuals perceived as possessing strong leadership skills, as rated by all other network members, are better able to understand the way that advice flows through an informal network than are those perceived to be low on this ability. Given that emergent leaders are recognized as such by engaging in behaviors such as influencing others as well as managing, shaping, and developing the collective activities of the group (Jacobs & Jaques, 1991; Zaccaro, Rittman, & Marks, 2001), it seems that emergent leaders, like formal leaders, are better able to recognize informal network structure due to their increased

interactions with network members and their motivation to lead other people. This finding has important implications for the Army as it suggests emergent leaders who hold no formal position in the platoon may have a substantial level of power and influence (Krackhardt, 1990) that formal leaders should be aware of.

A third finding revealed that individuals tend to seek advice from those they rate as having high leadership ability. Thus, whether consciously or unconsciously, Infantry platoon Soldiers garnered important work related information from individuals who they believe would be best suited to helping them achieve success. Such ratings *are not* merely indicators of how much an individual likes another, as individuals did not rate their friends as being better leaders than non friends. This finding mirrors that found by Hollander and Webb (1954) and is in line with past research that has shown that individual-level advice seeking behavior is related to knowledge and competence (Klein, Lim, Saltz, and Mayer, 2004).

A fourth finding in our study showed that Soldiers tend to be friends with others who are similar to them in terms of leadership ability (i.e. leader homophily). While this finding is not surprising given the homophily literature, it is potentially troubling in terms of fostering leadership skills in those who are low on leadership ability. More specifically, since Soldiers tend to be friends with others who are similar to them in leader ability, it seems that a certain level of stratification may be occurring, keeping those who have demonstrated leadership ability apart from those who have not. Consequently, to improve poor leaders' abilities it may be important for formal leaders to encourage intermingling and peer mentorship among platoon members.

Finally, the current study found that the processes underlying the perception of social and advice relations are distinct. For example, being central in the network is related to advice, but not friendship accuracy. This finding contradicts that reported in previous research which found that centrality in both the advice and friendship network were related to accuracy (Casciaro, 1998). Perhaps the relationship between centrality and accuracy is moderated by organizational context. For example, the current study was conducted with U.S. Army Infantry platoons, where friendships between formal leaders and non-leaders are not only *not* encouraged, but are discouraged. Consequently, it could be that centrality in this network is not related to accuracy because having an accurate representation of such a network will not help a member increase their influence or power with the platoon.

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## REFERENCES

- Balkundi, P. and Kilduff, M. (2005). The ties that lead: A social network approach to leadership. *The Leadership Quarterly*, 16, 941-961.
- Bass, B. M. (1990). Bass and Stogdill's handbook of Leadership: Theory, research, and managerial applications. New York, NY: The Free Press.
- Bondonio, D. (1998). Predictors of accuracy in perceiving informal social networks. *Social Networks*, 20, 301-330.
- Borgatti, S. P., & Foster, P.C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, 29, 991-1013.
- Cavins, B. J. (2006). The relationship between emotional-social intelligence and leadership practices among college student leaders. (Doctoral dissertation, Bowling Green State University, December 2005). *Dissertation Abstracts International*, 66, UMI Number: 3193385.
- Geiwitz, J. (1993). *A conceptual model of metacognitive skills* (ARI Tech. Rep. 51-1). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
- Greer, F. L., Glanter, E. H., Nordlie, P. G. (1954). Interpersonal knowledge and individual and group effectiveness. *Journal of Abnormal and Social Psychology*, 49, 411-414.
- Hains, S. C., Hogg, M. A., & Duck, J. M. (1997). Self-categorization and leadership: Effects of group prototypicality and leader stereotypicality. *Personality and Social Psychology Bulletin*, 23, 1087-1100.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York, NY: John Wiley.
- Hogan, R., Curphy, G. J., & Hogan, J. (1994). What we know about leadership: Effectiveness and personality. *American Psychologist*, 49, 493-504.
- Hubert, L. J. & Schultz, J. (1976). Quadratic assignment as a general data analysis strategy. *British Journal of Mathematical and Statistical Psychology*, 29, 190-241.
- Jacobs, T. O., & Jaques, E. (1991). Executive leadership. In R.Gal & D. A. Mangelsdorff (Eds.), *Handbook of military psychology*. Oxford, England: John Wiley & Sons.



- Kirkpatrick, S. A., & Locke, E. A. (1991). Leadership: Do traits matter? *Academy of Management Executive*, 5, 48-60.
- Krackhardt, D. (1987a). Cognitive social structures. *Social Networks*, 9, 109-134.
- Krackhardt, D. (1987b). QAP partialling as a test of spuriousness. *Social Networks*, 9, 171-186.
- Krackhardt, D. (1990). Assessing the political landscape; Structure, cognition, and power in organizations. *Administrative Science Quarterly*, 35, 342-369.
- Krackhardt, D. & Kilduff, M. (2002). Structure, culture, and Simmelian ties in entrepreneurial firms. *Social Networks*, 24, 279-290.
- Lord, R. G., Foti, R. J., & De Vader, C. L. (1984). A test of leadership categorization theory: Internal structure, information processing, and leadership perceptions. *Organizational Behavior and Human Performance*, 34, 343-378.
- Lord, R. G., & Maher, K. J. (1991). *Leadership and information processing: Linking perceptions and performance*. Boston: Unwin-Hyman.
- Morris, A. J. (1997). Perceptions of social structure, other and self: The role of social intelligence in managerial effectiveness. (Doctoral dissertation, University of California, Irvine, 20 June 1997). *Dissertation Abstracts International*, 46, 9712629.
- Yukl, G. (2006). *Leadership in organizations: Sixth Edition*. New Jersey: Prentice-Hall, Incorporated.
- Zaccaro, S. J. (1999). Social complexity and the competencies required for effective military leadership. In J. G. Hunt, G. E. Dodge, & L. Wong, (Eds.), *Out-of-the-box leadership: Transforming the twenty-first-century army and other top-performing organizations*. Greenwich, CT: Elsevier Science/JAI Press.
- Zaccaro, S. J., Gilbert, J. A., Thor, K. K., & Mumford, M. D. (1991). Leadership and social intelligence: Linking social perspectives and behavioral flexibility to leader effectiveness.. *Leadership Quarterly*, 2, 317-342.